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(64) Dispensing closure

(67) A dispensing closure comprises two parts which are separable with difficulty, the first part being provided with an aperture 7 bounded by a frusto-conical wall 6 and the second part being provided with a spigot 12 of such a size as to be an interference fit in the aperture of the first part. To dispense, the second part is rotated to bring an opening 10 therein into alignment with an aperture in the first part.

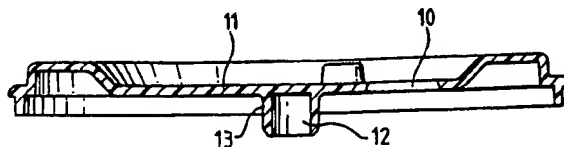


Fig.1.

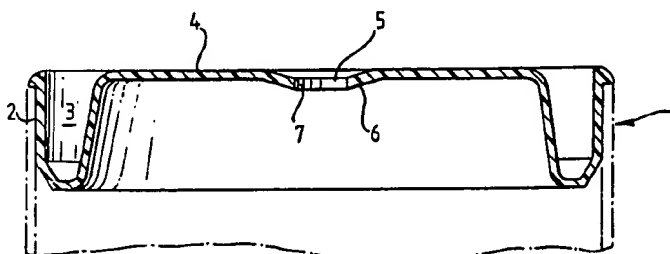


Fig.2.

The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

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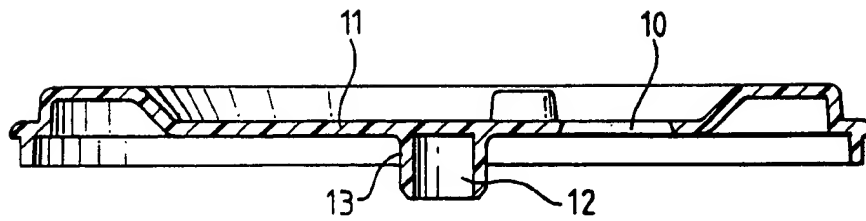


Fig.1.

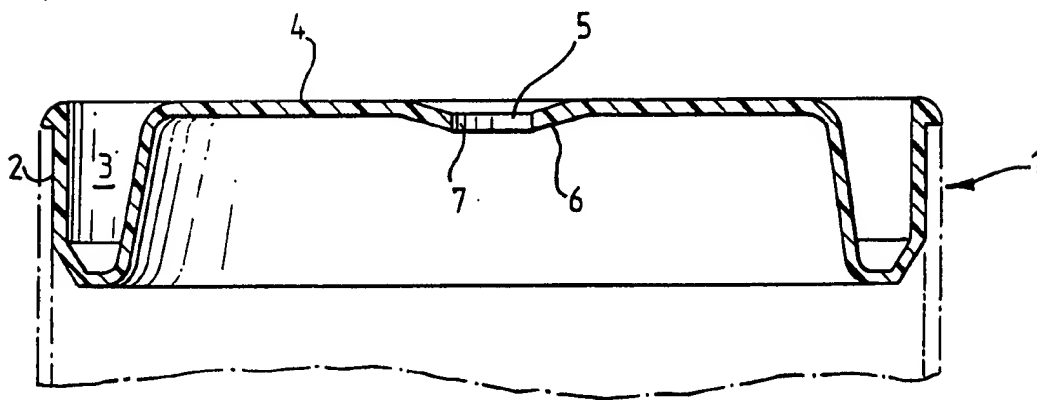


Fig.2.

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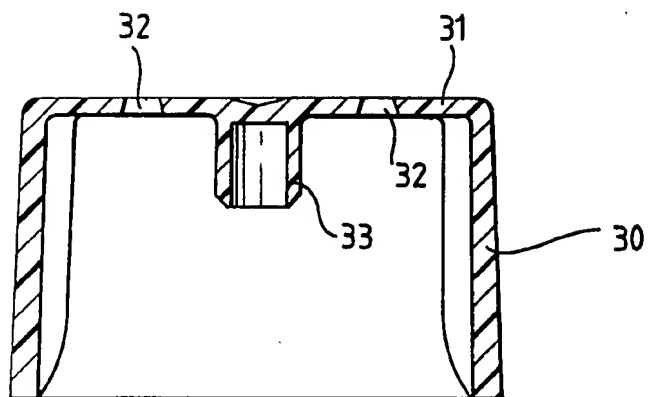


Fig.3.

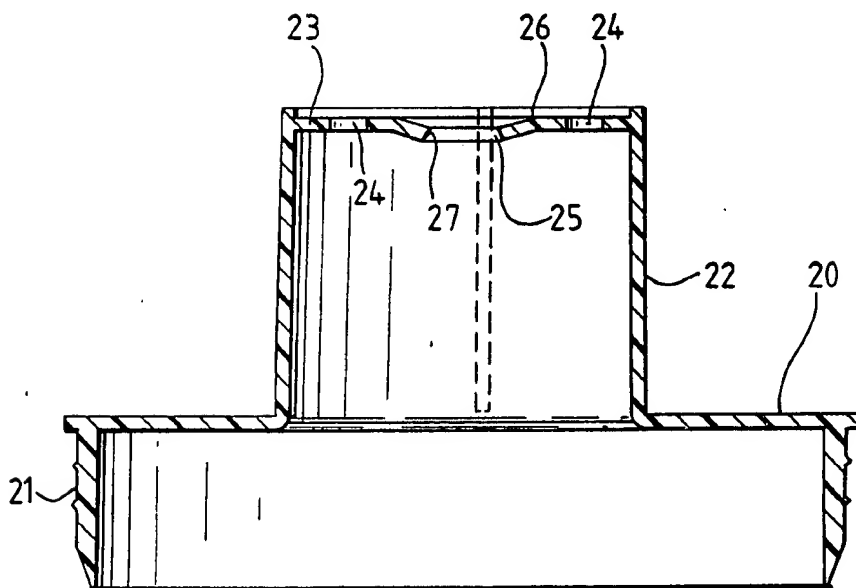


Fig.4.

## SPECIFICATION

## Dispensing closure

5 This invention relates to the joining of components in such a way that they cannot easily be separated, and is especially concerned with the joining together of two components of a closure member for a container, especially a dispensing closure.

10 It is known to provide containers for powdered or granular material with dispensing closures which comprise two relatively rotatable apertured discs superposed one on the other. When the outer of the discs is rotated to place its apertures in register with the apertures of the under lying discs, dispensing of the container contents may take place. The container is closed by rotating the outer disc to take the two sets of apertures out of register. It is further known to interpose a layer of resilient material, e.g. felted fibre, between the two discs, to reduce or eliminate leakage of powdered or granular material between the two discs.

A known form of container for powdered and granular material comprises inner and outer cardboard sleeves, the inner sleeve being slightly shorter than the outer sleeve. A disc-type dispensing closure is placed on the top of the inner sleeve, and the top of the outer sleeve is rolled over to provide a retaining bead for the closure.

30 Another known form of container is described in our Patent Specification 1,508,426.

It is an object of the present invention to provide means whereby two components, especially the two components of a disc-type dispensing closure, may be united in a simple and effective manner.

35 According to the present invention there is provided a two-part member in which the first part is provided with an aperture bounded by a frusto conical wall and the second part is provided with a spigot of such a size as to be an interference fit in said aperture.

When the two parts of the member are joined together, by inserting the spigot of one part into the aperture of the outer, subsequent separation of the parts is extremely difficult.

45 The two parts of the two-part member may suitably be formed in plastics material. The first part, that provided with the aperture, is suitably of a harder material than the second part. Thus, for example, the first part may be of an acrylonitrile-butadiene-styrene polymer, or high impact polystyrene, and the second part may be of polystyrene.

The frusto-conical wall in the first part bounding the aperture suitably slopes at an angle between 10° and 25° to the flat portion of the part surrounding the frusto conical wall. Most suitably this angle of slope is between 12° and 20°, for example 15°.

The wall of the aperture may be cylindrical in form, or may be cut away to provide a knife edge contact between the wall of the aperture and the wall of the spigot inserted therethrough.

When the two-part member forms a dispensing closure, one of said first and second parts will be the stationery closure element and the other of said parts will be the dispensing element which is

relatively rotatable thereto. As in known dispensing closures, a layer of resilient material may be interposed between the closure and dispensing elements. These elements will be provided with dispensing apertures which are put into register and out of register by suitably rotating the dispensing element.

The frusto conical wall may be continuous or dis-continuous, i.e. it may be formed with radial slots therein.

Two embodiments of the invention will now be described by way of example, and with reference to the accompanying drawings in which:-

75 *Figures 1 and 2* are cross-sectional views of a dispensing element and a closure element respectively of a two-part dispensing closure; and

80 *Figures 3 and 4* are cross-sectional views of the two elements of a second form of dispensing closure.

85 Referring firstly to *Figures 1 and 2*, the latter shows a closure element 1 which may be press-fitted into the top of a tubular container, e.g. a cardboard container. Flexibility of the cylindrical wall 2 of the element is provided by an annular channel 3 formed between the wall 2 and the central portion of the element. This central portion comprises a flat disc 4, containing at least one dispensing aperture, and a central aperture 5 bounded by a frusto-conical wall 6. Wall 6 slopes at an angle of the order of 15° relative to the flat top 4. The side 7 of the aperture 5 has a cylindrical configuration.

The second element of the dispensing closure is shown in *Figure 1*. This is circular in plan, as is element 1, and is provided with a dispensing aperture 10 in its flat top wall 11. The underside of wall 11 is provided with a spigot 12 which is an interference fit in aperture 5 of element 1.

The two elements are assembled together by pushing spigot 12 through aperture 5. By suitably sizing spigot 12 relative to aperture 5 considerable resistance to separation of the elements is set up between the side 7 of the aperture 5 and the contacting outer wall of spigot 12.

Both members may be made of plastics material, for example element 1 of an acrylonitrile-butadiene-styrene copolymer and the rotatable element of polystyrene.

110 *Figures 3 and 4* show a second form of dispensing closure, which uses the same method of attaching the two component elements together as does that of *Figures 1 and 2*. A base or support member 20, which may be snap-fitted to a cardboard tubular container such that the wall 21 is a tight fit within the container, is integrally formed with a neck 22 surmounted by a disc-like top 23 provided with dispensing apertures 24. A central aperture 25 is bounded by a frusto-conical wall 26 sloping at an angle of, for example, 15° relatively to the adjacent flat part of the disc top 23.

125 In this embodiment the side of the aperture 25 is cut away to provide a knife-edge 27.

A rotatable cap 30 has a disc-like top 31 provided with dispensing apertures 32 registrable with apertures 24, and a centrally-disposed spigot 33 formed on the underside of the top 31. The dispensing

closure is assembled in the same way as that of  
Figures 1 and 2, i.e. the cap 30 is pushed onto the  
neck 22 and the spigot 33 pressed into aperture 25.  
The frictional resistance set up between the wall of  
5 spigot 33 and the knife edge 27 of aperture 25 resists  
separation of the two elements of the closure  
member.

## CLAIMS

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1. A two-part member in which the first part is  
provided with an aperture bounded by a frusto-  
conical wall and the second part is provided with a  
spigot of such a size as to be an interference fit in

15 said aperture.

2. A member as claimed in claim 1, in the form of  
a dispensing closure, wherein said two parts are  
relatively rotatable and are provided with dispensing  
apertures which are in register in selective relative

20 positions thereof.

3. A member as claimed in claim 1 or 2 in which  
the first part is made of a harder material than that of  
which the second part is made.

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4. A member as claimed in claim 3 in which the  
first part is made of an acrylonitrile-butadiene-  
styrene polymer or high impact polystyrene.

5. A member as claimed in any of claims 1 to 4 in  
which the wall of the aperture makes an angle of  $10^\circ$   
to  $25^\circ$  with the flat portion of the part surrounding

30 the aperture.

6. A member as claimed in claim 5 wherein said  
angle is between  $12^\circ$  and  $20^\circ$ .

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7. A member as claimed in any of claims 1 to 6  
wherein the wall of the aperture comprises a sharp  
edge.

8. A member as claimed in any of claims 1 to 7  
wherein the frusto-conical wall is discontinuous.

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9. A two-part member as claimed in claim 2,  
substantially as described with reference to the  
drawings.

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